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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/848,732	05/19/2004	Roderic A. Schlabach	CTS-2445	7327

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CTS CORPORATION  
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ELKHART, IN 46514

EXAMINER
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ADDISON, KAREN B

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/848,732

Applicant(s)

SCHLABACH

Examiner

Karen B. Addison

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28-30 is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-15 and 18-25 is/are rejected.
- 7) ☒ Claim(s) 39-40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                 | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Allowable Subject Matter***

1. Claim 28-30 allowed.

Prior art fails to show, a actuator having a third dome shaped piezoelectric disc having a third concave surface and a third convex surface, a fourth dome shaped piezoelectric disc having a fourth concave surface and a fourth convex surface, the third and fourth r concave surface mounted facing each other; and the second concave surface mounted adjacent the third convex surface.

2. Claims 10,16-17,26-27,35-36,39-40 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art also fails to show, the first and fourth electrode formed form steel and the second and third electrodes formed from a perforated copper foil. Prior art also fails to show second a second terminal mounted to the first electrode and the third terminal is mounted to the fourth electrode. Prior art also fails to show, a third dome shaped piezoelectric disc having a third concave surface and a third convex surface, a fourth dome shaped piezoelectric disc having a fourth concave surface and a fourth convex surface', the third and fourth concave surface mounted facing each other; and the second concave surface mounted adjacent the third convex surface.

Prior art also fails to show, a first terminal mounted adjacent the first concave surface, a second terminal mounted between the first and second convex surfaces;

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a third terminal mounted between the second concave surface and the third convex surface; a fourth terminal mounted between the third and fourth concave surface; and a fifth terminal mounted adjacent the fourth convex surface. Prior art fails to show, a first terminal mounted adjacent the first concave surface; a second terminal mounted between the first and second convex surfaces; a third terminal mounted between the second concave surface and the third convex surface', a fourth terminal mounted between the third and fourth concave surface; and a fifth terminal mounted adjacent the fourth convex surface;

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8, 11-15, 18-25 is rejected under 35 U.S.C. 102(b) as being anticipated by Brandner (4927084).

Brandner discloses a piezoelectric bender in figs. 1-6 comprising: a Piezoelectric unit (12) having a first piezoelectric layer (14) adapted to bend in response to an applied voltage, a second piezoelectric layer (14) adapted to flatten in response to an applied voltage, the second piezoelectric layer mounted adjacent the first piezoelectric layer, the first and second piezoelectric layers moving opposite to each other in response to a

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change in temperature such that the piezoelectric bending actuator is stable over a range of temperatures. Wherein, the first and second piezoelectric layers are compressed and retained in a housing (1) along the outer peripheral edge (18) and the piezoelectric layers are polarized opposite (fig.5 negative, positive) to each other.

Brandner also show, an aperture (6) extending through the center of the first and second piezoelectric layers. Wherein, the first piezoelectric layers has a first surface and a second surface, a first electrode (16a) mounted to the first surface and a second electrode (16) mounted to the second surface, the second piezoelectric layer having a third surface and a fourth surface, a third electrode mounted to the third surface and a fourth electrode mounted to the fourth surface. Brandner also discloses the first, second and fourth electrodes formed of a rigid metal (col.6 lines 11-17) and the electrodes being connected to their respective surfaces. Wherein, the terminal is mounted between the second and third electrode (16a, 16), and the other terminal is mounted to the fourth electrode (16).

Referring to claims 11-16

Brandner discloses an actuator comprising: a first piezoelectric layer(14) having a top side and a bottom side, the first piezoelectric layer having a first polarity (fig.6 negative, positive), a second piezoelectric layer having a top side and a bottom side, the top side the second piezoelectric layer adjacent the bottom side of the first piezoelectric layer the second piezoelectric layer having a second polarity, the second piezoelectric layer polarity being opposite that of the first piezoelectric layer, the first and the second piezoelectric layers having opposite temperature responses such that the piezoelectric

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bending actuator is stable over a range of temperatures. Wherein, the first (14) and second piezoelectric layer (14) are compressed and retained in a housing (1). Brandner also disclose, and aperture (6) extending through the center of the first and second piezoelectric layers. Wherein, the first electrode (16a) is mounted to the first piezoelectric layer top surface; the second electrode (16) is mounted to the first piezoelectric layer bottom surface; the third electrode (16) is mounted to the second piezoelectric layer top surface; and the fourth electrode (16a) is mounted to the second piezoelectric layer bottom surface. Brandner further disclose the first terminal (11) is mounted between the second and third electrodes.

Referring to claims 18-21

Brandner discloses comprising: a first piezoelectric disc (14) adapted to bend in response to an applied voltage; at least one second piezoelectric disc (14) adapted to flatten in response to the applied voltage, the second piezoelectric disc (14) mounted adjacent to the first piezoelectric disc; the first and second piezoelectric discs moving between a first position and a second position in response to the applied voltage, the difference between the first and second position defining a displacement, the piezoelectric disc reacting to the changes in temperature such that the displacement is insensitive to temperature changes; and a housing, the first and second piezoelectric discs mounted in the housing. Wherein the Piezoelectric disc (14) flatten the temperature increase and the piezoelectric disc bend when the temperature decrease. Brandner also show how the first and second piezoelectric discs moves to offset each other (concave, convex) fig.5) such that no net displacement results.

It has been held that the recitation that an element is adapted to "perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. In re Hutchison, 69 USPQ 138.

Referring to claims 22-25

Brandner discloses an actuator comprising: a first dome shape Piezoelectric disc (14) having a first concave surface fig.3 (14) and a first convex surface (14), the first piezoelectric disc adapted to bend in response to an applied voltage; a second dome shaped piezoelectric disc (14) having a second concave surface and a second convex surface (14), the second piezoelectric disc adapted to flatten in response to an applied voltage; and the first (14) and second convex surface mounted adjacent each other.

Wherein, the first and second piezoelectric discs are mounted in a housing (1).

Brandner also disclose, the first and second disc having an outer peripheral edge and a center portion, a hole (6) extending through the center portion and the piezoelectric discs connectable with a movable object (25) through the hole. Wherein, the first and second piezoelectric disc bend or flatten (fig.3 &4) such that the motion of the first disc offset the motion of the second disc.

Referring to 31-34,37,38

5. Claims 31-34,37,38 is rejected under 35 U.S.C. 102(b) as being anticipated by Bost(4078160)

Boast disclose a piezoelectric bending actuator comprising: a ring (12); a retainer (61); and a plurality of piezoelectric unit (11) having disc (20,23) piezoelectric unit (11) held in

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compression between the ring and the retainer, the mounting of the discs in compression preventing operation of the disc in a state tension.

Wherein, the piezoelectric discs are held between the ring (12) and retainer (61) along an outer edge (31,32,33,) such that the center of the piezoelectric disc is free to move.

Wherein, the ring and retainer are mounted in the housing (54), the terminals are mounted (3 line 1-25) between each of the piezoelectric discs (20,23) and the adjacent piezoelectric discs are oppositely poled.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karen B. Addison whose telephone number is 571-272-2017. The examiner can normally be reached on 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KBA  
11/26/06

